

1.0 Introduction

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) is responsible for implementing the final response action selected in the final *Corrective Action Decision/Record of Decision for Rocky Flats Plant (USDOE) Peripheral Operable Unit and Central Operable Unit (CAD/ROD)* (DOE 2006a) issued September 29, 2006, for the Rocky Flats Site (Site). Prior to the CAD/ROD, cleanup and closure activities were completed in accordance with the requirements of the *Final Rocky Flats Cleanup Agreement (RFCA)* (CDPHE et al. 1996). Under the CAD/ROD, two Operable Units (OUs) were established within the boundaries of the Rocky Flats property: the Peripheral OU (POU) and the Central OU (COU). The COU consolidates all areas of the Site that require additional remedial or corrective actions while also considering practicalities of future land management. The POU includes the remaining, generally unimpacted portions of the Site and surrounds the COU. The response action in the Final CAD/ROD is no action for the POU and institutional and physical controls with continued monitoring for the COU. The Offsite Areas at Rocky Flats, known as OU 3, were addressed under a separate no-action CAD/ROD dated June 3, 1997.

The CAD/RODs for OU 3 and the POU determined that conditions in those OUs were suitable for unrestricted use. As a result, the U.S. Environmental Protection Agency (EPA) published a Notice of Intent for Partial Deletion (NOIPD) of the Rocky Flats Site (also known as the Rocky Flats Plant) from the National Priorities List (NPL) on March 13, 2007 (*72 Federal Register [FR] 11313, March 13, 2007*) to delete the POU and OU 3 from the NPL. The NOIPD was based on the results of the remedial investigations leading to the CAD/ROD no-action remedies being selected for these OUs. The NOIPD states that because no hazardous substances occur in the OUs above levels that allow for unlimited use and unrestricted exposure, no five-year review was required for these OUs. EPA subsequently published a Notice of Partial Deletion from the NPL for the POU and OU 3 on May 25, 2007 (*72 FR 29276, May 25, 2007*).

On July 12, 2007, most of the property outside the COU was transferred to the U.S. Department of the Interior for establishment of a national wildlife refuge managed by the U.S. Fish and Wildlife Service (USFWS). EPA certified that cleanup and closure of Rocky Flats was complete and that the COU remedy was operating properly and successfully, in accordance with requirements for DOE to transfer land to USFWS for establishing the refuge. DOE retained the COU and is responsible for implementing the CAD/ROD final response action and for ensuring that it remains protective of human health and the environment. The monitoring, surveillance, and maintenance activities for which quarterly, annual, and five-year review reports are issued are included in the *Rocky Flats Legacy Management Agreement (RFLMA)* (DOE 2007a).

RFLMA, signed March 14, 2007, superseded the RFCA. RFLMA is a Federal Facility Agreement and Consent Order under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the Colorado Hazardous Waste Act, between DOE, EPA Region 8, and the Colorado Department of Public Health and Environment (CDPHE). The purpose of RFLMA is to establish the regulatory framework for Attachment 2, “Legacy Management Requirements.”

RFLMA Attachment 2, Section 7.0, requires DOE to provide reports pertaining to the surveillance and maintenance of the remedy prescribed in the CAD/ROD on a calendar quarter and annual basis. The fourth quarterly report information is to be included in the annual report.

RFLMA Attachment 2, Section 7.2, specifies that the annual reports may include a summary for the previous quarter and shall include the following:

- A discussion of surface-water monitoring data
- A discussion of groundwater monitoring data
- A discussion of groundwater treatment system monitoring data
- A discussion of ecological sampling data
- A description of any adverse biological conditions
- A summary of actions taken in response to reportable conditions
- A summary of maintenance and repairs
- Inspection reports
- Verification of the Environmental Covenant and evaluation of the effectiveness of institutional controls (ICs)
- The Original Landfill (OLF) Monitoring Report (see Table 3 and Section 6.1 of the final *U.S. Department of Energy Rocky Flats Site, Original Landfill Monitoring and Maintenance Plan* [OLF M&M Plan] [DOE 2009a])
- The Present Landfill (PLF) Monitoring Report (see Table 3 and Section 6.1 of the *Present Landfill Monitoring and Maintenance Plan and Post-Closure Plan, U.S. Department of Energy Rocky Flats Site* (PLF M&M Plan) [DOE 2008a]);
- Assessments of analytical data, including laboratory audits
- Other conditions or actions taken that are pertinent to the continued effectiveness of the remedy

This calendar year (CY) 2011 Annual Report contains the summary for the fourth quarter of CY 2011.

LM prepared the *Rocky Flats Site Operations Guide* (RFSOG) (DOE 2011a) as a document to guide work at the Site. The RFSOG provides details on the surveillance and maintenance needed to satisfy the requirements of the CAD/ROD as well as best management practices (BMPs) at the Site. As a “desktop procedure,” the RFSOG explains how DOE will fulfill its long-term surveillance and maintenance obligations at the Site.

While the specific BMPs are not subject to regulation under RFLMA, this annual report includes a discussion of activities related to implementing BMPs to document the information for future reference and for a perspective of the work conducted over the year.

1.1 Purpose and Scope

The purpose of this report is to inform the regulatory agencies and stakeholders of the surveillance, monitoring, and maintenance activities being conducted at the Site. LM provides periodic communications such as this report and communicates through other means such as Web-based tools and public meetings.

This annual report focuses on routine surveillance, maintenance, and monitoring activities that were conducted during CY 2011 and, as stated previously, also includes information for the fourth quarter of CY 2011. Topics covered include Site operations and maintenance (Section 2.0) and environmental monitoring, including water and ecological monitoring (Section 3.0). Data management, data validation, and an assessment of data quality are also included in Section 3.0. References cited in this report are included in Section 4.0.

Supporting information is provided in a series of appendixes. Appendix A provides the hydrologic data, and Appendix B provides the water quality data. The fourth quarter of CY 2011 landfill inspection forms for the PLF and OLF are included in Appendix C. RFLMA and RFSOG data evaluation flowcharts are provided in Appendix D. Appendix E contains the *Technical Memorandum Regarding Instrumentation and Monitoring at the Rocky Flats OLF*. Appendix F contains the *Solar-Powered Air Stripping at the Rocky Flats Site, Colorado*, which describes the Mound Site Plume Treatment System (MSPTS) air stripper. Appendix G contains the RFLMA contact records issued during CY 2011.

1.2 Background

Surveillance, maintenance, and monitoring activities are conducted according to RFLMA. RFLMA incorporates the following plans:

- The OLF O&M Plan (DOE 2009a)
- The PLF M&M Plan (DOE 2008a)

RFLMA Attachment 2 stipulates that DOE employ administrative procedures to control activities in accordance with the ICs and to meet quality assurance and quality control program requirements. Other Site procedures are established to guide work and implement BMPs. These procedures are referenced in the RFSOG and include:

- The *Operations and Maintenance Plan for Rocky Flats Surface Water Control Project* (DOE 2010a);
- The *Operations and Maintenance Manual for the Rocky Flats Groundwater Treatment Systems* (DOE 2010b);
- The *Rocky Flats, Colorado, Site Revegetation Plan* (DOE 2009b);
- The *Erosion Control Plan for the Rocky Flats Property Central Operable Unit* (DOE 2007b);
- The *Rocky Flats, Colorado, Site Vegetation Management Plan* (DOE 2009c);
- The *Ecological Monitoring Methods Handbook for the Rocky Flats, Colorado, Site* (DOE 2008b); and
- The *Legacy Management CERCLA Sites Quality Assurance Project Plan* (LMS/PLN/S04353).

1.3 RFLMA Contact Records

This section provides a summary of the status of activities addressed by RFLMA contact records issued during 2011. RFLMA references the use of contact records to document CDPHE oral

approvals of field modifications to implement approved response actions (see RFLMA paragraph 34). Excavation or soil disturbance activities that are subject to ICs must have prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2, Section 4.1, and results of consultation will be documented in contact records or written correspondence. RFLMA Attachment 2 also references the use of contact records to document the outcome of consultation related to addressing any reportable conditions (see RFLMA Attachment 2, Section 6.0). Finally, the *Rocky Flats Site Legacy Management Public Involvement Plan* (PIP), in RFLMA Appendix 2, also provides that a contact record of consultative process discussions between the RFLMA Parties will be made available to the Rocky Flats Stewardship Council and other interested stakeholders as early in the process as is practicable following signature approval by the parties. The PIP process to make contact records available is implemented by posting contact records on the Rocky Flats public website and by promptly notifying stakeholders (by e-mail) that the contact record is posted.

The RFLMA Parties agreed, as documented in RFLMA Contact Record 2007-08, that DOE will document the status of actions or activities in RFLMA contact records from time to time and will include the documentation in RFLMA quarterly and/or annual surveillance and maintenance reports for tracking purposes. The RFLMA Parties also agreed that to facilitate the status reporting, contact records should include a short discussion of the anticipated actions or activities to close out the RFLMA contact record. Thus, RFLMA Contact Record 2007-08 and subsequent contact records will include the closeout discussion.

Under certain situations, activities previously approved in a contact record that has been closed out will need to be performed. A simple notification and approval process has been developed for these situations, which is documented in RFLMA Contact Record 2009-05. CDPHE may receive notification of and approve the activities over the phone or in person, with e-mail follow-ups. The notification and approval of such work shall be reported in the next RFLMA annual report, in relation to the contact record that originally covered the work. This protocol is consistent with RFLMA paragraph 34.

Table 1 lists the RFLMA contact records issued in 2011 and their status at the end of 2011. The table also lists contact records that were issued from 2007 to the end of 2010, were discussed in the 2010 Annual Report, and were not closed by the end of 2011, and the table indicates their status at the end of 2011. The table also lists e-mail approval of activities previously covered by closed out contact records. Appendix G contains copies of the 2011 contact records.

1.4 RFLMA Modifications and CAD/ROD Amendment

There were two modifications to RFLMA Attachment 2, “Legacy Management Requirements,” approved by CDPHE and EPA in 2011. The first was related to changes to surface-water Point of Compliance (POCs) locations and deletion of Boundary Well monitoring. The second was related to implementation requirements of the 2011 CAD/ROD amendment (DOE, EPA, and CDPHE 2011) to clarify certain ICs.

1.4.1 Changes to Points of Compliance

As discussed in the second quarterly report for CY 2011 (DOE 2011f), a RFLMA Attachment 2 modification for changes to monitoring locations was approved by CDPHE and EPA on

May 2, 2011 (CDPHE and EPA 2011). Changes to surface-water monitoring locations were the following:

- Designation of a new POC monitoring location named WALPOC inside the COU boundary, removing GS08 and GS11 as POCs in Walnut Creek, after completion of installation of the new flume for WALPOC
- Designation of new POC monitoring location named WOMPOC in Woman Creek inside the COU boundary, removing GS31 as a POC at the outfall of the Pond C2 Dam upstream of WOMPOC, after completion of installation of the new flume for WOMPOC

The modification calls for retaining the Woman Creek and Walnut Creek POCs at Indiana Street (GS01 and GS03, respectively) in the POU for a period of 2 years after the new flumes in the COU are operational.

RFLMA Attachment 2, Section 5.1, “Monitoring Surface Water,” includes the following statement:

After each new flume and associated sampling equipment is installed and tested for proper operation, DOE shall notify CDPHE and EPA that construction is complete. WALPOC will replace GS08 and GS11 on the date of the DOE notification for that location. WOMPOC will replace GS31 on the date of the DOE notification for that location. WALPOC and WOMPOC will also replace GS03 and GS01 respectively upon DOE notification to EPA and CDPHE certifying that WALPOC and WOMPOC have been functioning as POCs for at least two years.

As discussed in the third quarterly report for CY 2011 (DOE 2012a), DOE provided the notification that construction was complete to CDPHE and EPA for WALPOC on September 9, 2011 (DOE 2011h), and for WOMPOC on September 28, 2011 (DOE 2011i).

1.4.2 Boundary Wells

The two Boundary Wells were deleted as RFLMA required monitoring locations in the March 2011 RFLMA Attachment 2 modification. The final Boundary Well sample results were included in the second quarter report for 2011 (DOE 2011f) and are discussed in the Routine Monitoring section of this annual report. These wells are scheduled to be abandoned in the near future.

1.4.3 Institutional Controls

The RFLMA Parties released the approved *Final Corrective Action Decision/Record of Decision Amendment for Rocky Flats Plant Peripheral Operable Unit and Central Operable Unit and Modification of the Rocky Flats Legacy Management Agreement*, Attachment 2, “Legacy Management Requirements,” on September 22, 2011 (DOE, EPA, and CDPHE 2011). The CAD/ROD amendment includes a comment responsiveness summary regarding the consideration of public comments by the RFLMA Parties in finalizing the CAD/ROD amendment and the RFLMA Attachment 2 modification.

In the 2006 CAD/ROD, the original response actions selected for the COU were ICs, physical controls, and continued monitoring. The CAD/ROD amendment clarifies the description of

certain ICs required for the COU to more accurately reflect the objective and rationale of the ICs as stated in the 2006 CAD/ROD. The objective and rationale of the ICs have not changed.

In addition, the CAD/ROD amendment:

- Removes the 2006 CAD/ROD requirement that any modification to ICs can be made only by a formal CAD/ROD amendment, providing instead that proposed changes to ICs in the future will follow the process in regulations and guidance in effect at the time of the proposal.
- Requires that the existing environmental covenant granted by DOE to CDPHE in accordance with State law will be modified to reflect the IC clarifications.

The Environmental Covenant modification (DOE and CDPHE 2011) was signed by DOE and CDPHE on November 14, 2011, and filed in the land records of Jefferson County on December 12, 2011, with instrument number 2011112377. The modification is also on file in the Rocky Flats administrative record, #PD-A-000444.

The modification of RFLMA Attachment 2 incorporates the IC description changes made in the CAD/ROD amendment and also incorporates the objective and rationale of each IC. The RFLMA Attachment 2 modification implements the Soil Disturbance Review Plan, which is required by the CAD/ROD amendment. Excavation or soil disturbance activities that are subject to ICs must have prior regulatory review and approval pursuant to the Soil Disturbance Review Plan in RFLMA Attachment 2, Section 4.1.

The newly added Soil Disturbance Review Plan in the RFLMA Attachment 2 modification essentially formalizes a process that was already being used to evaluate proposed soil-disturbing activities that are subject to ICs.

The modification requires that the use restrictions specified as ICs be implemented to meet the objective and rationale of the IC as provided in the CAD/ROD. DOE shall follow the RFLMA consultative process pursuant to Part 5 of RFLMA for any regulatory determination required regarding activities subject to an IC.

Results of consultation will be documented in contact records or written correspondence. Except for situations where immediate action is warranted, DOE will not implement the activity for which the regulatory determination is required until 10 calendar days after the contact record or written correspondence approving the activity is posted on the Rocky Flats website and notification of the posting is made to stakeholders in accordance with the RFLMA Public Involvement Plan.

Table 1. Status of RFLMA Contact Records

Contact Record No.	Purpose	Approval Date	Status as of December 31, 2009
2011-01	Replace Mound Site Plume Treatment System media and maintain/repair discharge gallery.	1/14/11	Actions completed—closed
2011-02	Replace Sentinel well 33703	3/23/11	Actions completed—closed
2011-03	Resource Conservation and Recovery Act Well Monitoring Results at Original Landfill and Present Landfill	4/25/11	Actions completed—closed
2011-04	Reportable Condition for Uranium at Point of Evaluation GS10	7/8/11	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed.
2011-05	Update for Reportable Condition for Uranium at Point of Evaluation GS10	10/4/11	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed.
2011-06	Soil Disturbance Review Plan—Roads upgrade project involving reconfiguration of a sharp curve west of Functional Channel 1	10/18/11	Actions completed—closed
2011-07	Soil Disturbance Review Plan—Pond A-3 and Present Landfill Pond Dam Breach Project	12/5/11	Contact record will be closed when the work is completed, post-construction reseeding has been performed, and erosion controls are in place.
2011-08	Reportable Condition for Americium-241 at Point of Evaluation GS10	12/23/11	Contact record serves as the plan and schedule for the evaluation of the reportable condition and will be closed when the evaluation is completed.
2010-03	Non-Rocky Flats Legacy Management Agreement (RFLMA) Surface Water Monitoring Project for North and South Walnut Creeks	3/15/10	Contact record will be closed after completion of the non-RFLMA sampling project described herein. After this contact record is closed out, additional non-RFLMA sampling activities may be performed, and CDPHE will be kept apprised of the additional sampling through the consultative process.
2010-04	Rocky Flats Legacy Management Agreement Attachment 2: Modification to Revise Monitoring Points	7/15/10	Actions completed—closed
2009-01	Phase II and III Upgrades to Solar Ponds Plume Treatment System	2/17/09	Construction and post-construction revegetation and erosion controls are in place. Optimization of the upgrades and monitoring is ongoing. Contact record will be closed when testing is completed and as-built drawings are completed.
2008-06	Management of intercepted groundwater during SPPTS repair or maintenance activities	7/9/08	Actions continuing
2007-06	Evaluation of elevated nitrate in groundwater samples from Area of Concern well B206989	10/16/07	Continuing monitoring and evaluation

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